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SURVEYING THE SCHOLARSHIP OF TEACHING AND LEARNING

We must change the status of teaching from private to community property.[1]

Related to the public domain is the more general idea of "the commons"—resources that are not divided into individual bits of property but rather are jointly held so that anyone may use them without special permission.[2]

IN THIS BOOK WE OFFER a vision of the scholarship of teaching and learning in higher education that calls for a transformation affecting all teachers. Though employed in different ways and to different degrees, the scholarship of teaching and learning entails basic but important principles that can and should be in every professor's repertoire. It means viewing the work of the classroom as a site for inquiry, asking and answering questions about students' learning in ways that can improve one's own classroom and also advance the larger profession of teaching.

Indeed, we see the scholarship of teaching and learning as part of a wider phenomenon that we call the teaching commons, an emergent conceptual space for exchange and community among faculty, students, administrators, and all others committed to learning as an essential activity of life in contemporary democratic society. Thus we bring a broad view to the topic, and a hopeful one. We see the scholarship of teaching and learning not as a corrective to something that has gone wrong, not as a fix for something broken, but as a set of habits and dispositions for meeting

the challenges that we all face as learners and citizens in the twenty-first century.

For some time now, college and university professors have been feeling the once-steady ground of classroom teaching shift beneath their feet. Faced with an increasingly diverse student population, new communication technologies, and changing educational priorities, they are doing their best to respond. Across disciplines, institutions, systems, and countries, educators are asking new questions about what to teach in their courses and programs, how best to engage students in learning that matters, and how to help them put the pieces together to find meaning in their college careers. Moreover, they are sharing the answers to these questions in ways that promise to transform higher education.

Consider Dennis Jacobs, a chemistry professor at the University of Notre Dame, who until 1997 taught in a conscientious but conventional way. Writing about his experience, Jacobs notes that things changed when "I began teaching a large general chemistry course with nearly one thousand students divided into four lecture sections. It was a traditional introductory science course, but for me it became a concern when my office hours for the course were dominated by students who were struggling." Poorly prepared in high school, they were "caught off guard" by exams that required real problem solving. And after getting low marks on one or two exams, they would withdraw from the course (Jacobs, 2000, p. 41). This scene has played out over and over again in introductory science and mathematics at colleges and universities of all kinds (Seymour and Hewitt, 1997). It is a failure that is no longer considered an acceptable, if regrettable, par for the course.

In fact, Dennis Jacobs is one of a growing number of faculty who understand that introductory chemistry is a gateway to a number of majors and that, for many students, dropping out of "101" means dropping any dream of being a scientist, an engineer, a doctor. So, instead of just writing them off as "too dumb" for science (Tobias, 1990), Jacobs put his head to the problem. He consulted the growing body of literature about chemistry and physics education, he got help from Notre Dame's teaching and learning center and its office for institutional research, and he created an alternative learning environment for at-risk students, where lectures are interspersed with opportunities for students to work together on challenging problems, defend their ideas, and articulate their understandings. His array of assessments showed that the alternative approach significantly improved retention and achievement in subsequent courses, and convinced faculty in other science fields at Notre Dame to adopt a similar model. Jacobs has received national recognition for his work, and

he has presented it in scholarly forums where other faculty can learn from, engage with, and critique his results.[3]

Stories like those of Dennis Jacobs are increasingly common. Often, though not always, flying the flag of "the scholarship of teaching and learning," faculty members in all fields of undergraduate instruction and in all types of institutions are taking teaching public: documenting what they do, engaging in classroom inquiry, gathering evidence, and building and sharing knowledge to improve practice. This book is about the ways in which these faculty are going about their work as teachers, and how they are helping to build a larger commons through that work.

The Scholarship of Teaching and Learning

Introduced into the vocabulary of higher education by *Scholarship Reconsidered* (Boyer, 1990), the scholarship of teaching and learning gained a hearing less because of its novelty or precision than because it gave teaching a place in a broader vision of scholarship that also included discovery through basic research and efforts to advance the integration and application of knowledge. As a scholarly enterprise, Boyer wrote, "Teaching is . . . a dynamic endeavor involving all the analogies, metaphors, and images that build bridges between the teacher's understanding and the student's learning. Pedagogical procedures must be carefully planned, continuously examined, and relate directly to the subject taught" (pp. 23–24). By focusing on the intellectual demands of teaching in *Scholarship Reconsidered,* and especially in its sequel, *Scholarship Assessed* (Glassick, Huber, and Maeroff, 1997), Boyer and his colleagues attempted to foreground what the scholarship of teaching and learning shares with other kinds of scholarly work (see Rice, 1991).[4]

Meanwhile, a host of related developments gave further momentum and substance to the concept. Scholars of teaching and learning were able to draw on a long-standing literature on teacher knowledge (for example, Shulman, 1987; Grossman, Wilson, and Shulman, 1989), and on more recent research into the character of learning itself (Bransford, Brown, and Cocking, 1999; Marchese, 1997). The assessment movement, and especially the phenomenon of classroom assessment, sharpened higher education's focus on student learning and provided tools for faculty seeking to investigate the impact of their course designs and pedagogies on student learning (Angelo and Cross, 1993; Cross and Steadman, 1996). An interest in course and teaching portfolios and other strategies for the peer review of teaching expanded the audience for teaching to include colleagues as well as students (Edgerton, Hutchings, and Quinlan, 1991;

Centra, 1993; Shulman, 1993; Hutchings, 1996; Seldin, 1997). The 1990s were also a decade that saw the establishment and growth of teaching and learning centers, which, on many campuses, provided programming and support for faculty reflecting on and sharing their teaching practice. More recently, many of these centers have explicitly embraced the agenda and language of the scholarship of teaching and learning, as have many of the scholarly and professional societies.

As the scholarship of teaching and learning has evolved and been enriched by intersections with related initiatives, its boundaries have been subject to debate; indeed, much of the discussion has been about definitions and distinctions. For one thing, it has become clear that there are elements of discovery, integration, and application within the scholarship of teaching and learning, because this work typically involves classroom inquiry, synthesizing ideas from different fields, and the improvement of practice, all at the same time. It is also clear that the scholarship of teaching and learning may look different in different disciplines. To be sure, many pedagogical issues and topics cut across fields. But most faculty members think about teaching and learning inside the framework of their own (and closely related) fields, which is also where many of their best aspirations for students lie. Biologists, historians, and psychologists may all agree that they want to foster deep understanding in their college classrooms, but what they mean by deep understanding is different (Donald, 2002; see also Becher and Trowler, 2001), and so too is the way they are likely to go about the scholarship of teaching and learning (Healey, 2002; Huber, 2000; Huber and Morreale, 2002a; Lueddeke, 2003). Finally, there have been many useful attempts to parse the work into different stages or levels of elaboration (see, for example, Hutchings and Shulman, 1999; Kreber, 2001, 2002, 2003; Kreber and Cranton, 2000; Richlin, 2001, 2003; Trigwell, Martin, Benjamin, and Prosser, 2000; Trigwell, 2004).

In the face of different images of the scholarship of teaching and learning, the two of us have come to embrace a capacious view of the topic, wanting to draw this movement in the broadest possible terms—as a big tent, if you will, under which a wide range of work can thrive. The core of that work includes the kinds of inquiry and investigation that faculty are most likely to undertake when they examine and document teaching and learning in their classrooms in order to improve their practice and make it available to peers. But this work can include (at one end) studies with elaborate research designs and formal execution that go beyond a single classroom, program, or discipline, as well as (at the other end) quite modest efforts to document and reflect on one's teaching and share what one has learned.

Whatever its shape or approach, it is difficult work that tends to run against the grain of academic culture. Faculty today are being asked to do more than ever, with fewer resources, greater accountability, and uncertain rewards. In this climate, calls for a scholarship of teaching and learning can easily be seen as loading even more on weary professorial backs. Done well, however—which means voluntarily and with the right level of support—such work can be empowering for faculty and for their students. Through the scholarship of teaching and learning, faculty can systematically improve the educational environments they create in their own courses and programs and help build the larger commons in ways that support the work of others in their institutions and disciplines seeking to foster the kinds of learning needed today.

The Teaching Commons: What's at Stake

Higher education has long fostered the robust commons created by scientific and scholarly research. This has not been the case with teaching and learning. Until quite recently, serious research on the education of college students was the province of relatively small, disconnected communities of scholars reading and contributing to the newsletters, journals, and conferences where pedagogical issues in their fields were aired. Their work has much to offer, but many college and university faculty were not aware of it. For the large majority, conversations about teaching and learning were local, even fugitive affairs, confined to college and departmental committees and to circles of close friends. No wonder teaching was so often undervalued. As Lee Shulman observed in one of the key texts of the movement to build a scholarship of teaching and learning, teaching will not be fully recognized in the academy until its status changes from "private to community property" (1993, p. 6). Without a functioning commons, it is hard for pedagogical knowledge to circulate, deepen through debate and critique, and inform the kinds of innovation so important to higher education today.

In many arenas—natural resources, the Internet, scientific research—the notion of the commons tends to be invoked to mourn its passing or warn against its loss. For better or worse, history provides many examples of shifts from public to private control, from the enclosure movement in England, in which the landed classes took over open fields traditionally managed by local communities, to the recent trend for business interests to seek greater sway over the use of public resources, such as land, water, the airwaves, the Internet, and the results of federally funded research (Bollier, 2001; Lessig, 1999). As the higher education community glimpsed

in the rush to e-learning in the 1990s, the field of teaching and learning is potentially as vulnerable to enclosure as other intellectual and cultural resources (McSherry, 2001). But the more immediate challenge is to strengthen and enlarge the commons that is now taking shape, to make teaching, in the words of one report, "a subject of common engagement within the academy" (Knight Higher Education Collaborative, 2002, p. 1; see also Zemsky and Massy, 2004).

The elements of a teaching commons are developing at a rapid pace. On campuses, a wide array of educational initiatives are converging on issues of teaching and learning, including reforms in graduate education like the Preparing Future Faculty program, the design of opportunities for integrative learning throughout the curriculum, and the introduction and refinement of course management systems and other technology initiatives. Higher education associations and scholarly societies have increased the amount of air and column space they give to educational issues, in part because knowledge practices are changing in many fields. In the humanities, for example, the new media and the access they afford to primary documents in history, literature, and culture have transformed possibilities for undergraduate instruction. And the sciences have enjoyed unprecedented levels of funding for projects in teaching and learning, reflecting changes in national policy that have emphasized recruiting and retaining women and minorities in science fields, as well as raising the level of scientific literacy for science and nonscience majors alike (Seymour, 2002).

Many of these developments and issues have an international dimension. Scholars in the United States are finding lively colleagues in countries like Canada, the United Kingdom, Ireland, Australia, and New Zealand, where there are strong traditions of pedagogical research (see Kreber, 2002). The International Symposium on Improving Student Learning, organized by the Oxford Center for Staff and Learning Development of Oxford-Brookes University in England, has been meeting annually since 1992. City University of London has sponsored an international conference on the scholarship of teaching and learning for several years, and the newly formed International Society for the Scholarship of Teaching and Learning promises to bring even larger and more diverse communities together. Developments in the European Union also appear to be moving in a direction that calls for more systematic attention to undergraduate instruction, and indeed, globalization is pushing similar developments in countries everywhere that are hoping to attract international students or send their own students to study abroad (see, for example, Centre for Higher Education Research & Information, 2004). In short, it is fair to say that the teaching commons is growing in size, diversity, and momentum.

The development and stewardship of this commons matters not only to faculty and students but to all who care about the quality of higher education and its larger social role. What happens in the classroom (and in laboratories, internships, field sites, and the like) is critical to what students actually learn in college and to their future personal, professional, and civic lives. One of higher education's proudest achievements has been to increase access for high school graduates and for adults returning to college in countries around the world. Assuring access remains a continuing challenge, especially in hard economic times. But with globalization raising the bar for productive employment and responsible citizenship, educators everywhere are recognizing that access alone is not enough. As Patti Gumport and Robert Zemsky (2003) argue, today's urgent policy issues must now include "access to what?" (see also National Center for Postsecondary Improvement, 2002).

Certainly, "access to what?" is a question that is turning policymakers' attention to teaching and learning in the United States. Congressional debates on higher education policy focus on how to ensure that college students are receiving a quality education; the National Center for Public Policy in Higher Education is seeking measures of student outcomes for its state-by-state report card; researchers are constructing new measures of undergraduate experience, like the National Survey of Student Engagement; accrediting agencies, like the Western Association of Schools and Colleges or the Accrediting Board for Engineering and Technology, are adding criteria about student learning; and colleges and universities themselves are experimenting with a variety of new assessments and approaches in which students document, reflect on, and connect the different facets of their education.[5]

Pedagogy Moves Center Stage

For most of the history of higher education in the United States, the form and content of the curriculum have been the most common sites for realigning college studies with changes in the larger social and scholarly worlds. What makes today's situation unusual is that pedagogy has finally slipped off the cloak of tradition, and, like other institutions of cultural transmission that are no longer taken for granted, become "controversial, conscious, constructed: a matter of decision, will, and effort" (Bailyn, 1960, p. 48).

This is not to say that pedagogy remained unchanged for over four hundred years. Indeed, there were important shifts, most notably in the mid- to late nineteenth century, when the prescribed curriculum of classical and

literary studies was replaced with the elective system in which students could choose among courses in the modern arts and sciences. Debates raged about how to make room for these new fields of knowledge in college study, but without much fanfare classroom teaching changed as well. Laboratories and seminars replaced traditional recitations and disputations, and the old goals of mental training gave way to inquiry and critical thinking as valued habits of mind.[6] Indeed, this new understanding of learning made it possible for educators to see pedagogical virtue in the elective system itself. According to historian Julie Reuben: "Instructors expected students to question established views, learn how to gather and evaluate evidence in favor of theories, and judge for themselves the adequacy of various positions. Electives accorded well with the ideals of open inquiry because they required students to make free choices. . . . [They] encouraged the same habits of mind required by scientific inquiry, and university policies were thus seen to reflect [these] ideals" (1996, p. 67).

In the early twentieth century, colleges and universities continued to accommodate new disciplines, professions, and civic institutions by changing the curriculum to meet new needs. Yet as the subjects of study proliferated, and as the numbers and kinds of students coming to college grew and diversified, educational leaders of that era became concerned. Was there a way to strike a balance between the two basic models of undergraduate study that they had inherited from the past: the one oriented toward community and the authority of tradition, and the other embracing individual choice and the critical spirit of science?[7] Following Harvard's introduction of distribution and specialization requirements in 1910, most colleges and universities settled on some variation of general education for freshmen and sophomores and in-depth study in "the major" for juniors and seniors (Rudolph, 1977). This produced a remarkably flexible arrangement that could accommodate society's need for both a liberally educated citizenry and a workforce prepared for the modern, specialized professions required to manage the new, industrialized economy (see Goldin, 2001).

The very flexibility of this compromise kept colleges and universities open to debate about the content of the curriculum—though seldom how it was taught. What subjects should all college students study? What should be open to choice? How could an institution balance the goals of liberal learning with the logic of disciplinary specialization, especially when general education was channeled into options offered and controlled by different departments? A steady stream of new academic fields and professional studies pushed in the direction of curricular growth and frag-

mentation, periodically calling forth reformers who pushed back for community and a common curricular core. Writing in the late 1970s, Ernest Boyer and Arthur Levine identified three such revivals centering around World War I, World War II, and again in response to a sense of national crisis following the cultural upheavals of the 1960s and concerns about American economic competitiveness in the world economy (1981).[8]

Other, less heralded innovations accompanied this pulse of public debates about the size and shape of the curriculum. For example, the progressive college movement of the 1920s and 1930s produced experiments, such as those at Sarah Lawrence College, where students designed their own courses of study, received no grades, and contributed labor toward the upkeep of the institution (Kimball, 2003). The "Great Books" curriculum and undergraduate seminars that developed at the University of Chicago in the 1930s and 1940s influenced the design of honors programs around the country. New cluster colleges and interdisciplinary programs encouraging independent study sprang up in the wake of student unrest in the 1960s. And here and there, older traditions of classroom teaching were transformed. Emergent fields like composition and women's studies brought ideas about critical pedagogy into wider view, while innovative attempts to adapt pedagogical ideas from developmental psychology and behavioral psychology (mastery learning, or "the Keller Plan") also flourished for a while.

For much of the twentieth century, however, conversations about teaching and learning in college remained backstage. Certainly, there were influential statements by educational leaders, and important reports, like the Harvard "Red Book" with its vision for the post–World War II liberal arts (Harvard Committee, 1945). Occasionally, too, intellectual leaders like Nobel Prize–winning scientists or presidents of prominent scholarly societies weighed in on educational issues. Dedicated pedagogical researchers worked in shadowy corners of their disciplines and institutions. Faculty attending the annual conferences of their disciplines could take in a few sessions on teaching. And a small number of societies sponsored specialized educational journals, like the American Society for Engineering Education, which began producing a newsletter in 1910, and the Division of Chemical Education of the American Chemical Society, which has published the *Journal of Chemical Education* since 1924.

However, it was only during the explosive era of growth and challenge of the late 1960s that pedagogical issues found regular outlets for dissemination, discussion, and debate in the wider higher education community, many of which remain current today.[9] During this period, there

was an intensification of scholarly research on all domains of academic life, pedagogy included. The Carnegie Commission on Higher Education (later, the Carnegie Council on Policy Studies in Higher Education) initiated an extraordinarily influential series of studies in 1969, while the *Chronicle of Higher Education, Change,* and Jossey-Bass all started publishing news, commentary, and books at about the same time. The Department of Education's Fund for the Improvement of Postsecondary Education (FIPSE) began supporting pilot projects on campuses around the country in 1972 (Miller, 2002), and, in the 1980s, the National Science Foundation began to introduce new initiatives to expand, broaden, and improve undergraduate education in science, technology, engineering, and mathematics, engaging not only educational specialists but mainstream faculty as well (Seymour, e-mail to the authors, April 18, 2005; see also Seymour, 2001; Wankat, Felder, Smith, and Oreovicz, 2002).

Amid this ferment, pedagogy—long in the background—began to move forward, if not to the center of the stage. Increasingly, even questions about curriculum and content morphed into concerns about crosscutting dispositions and skills, and faculty began to design courses that would teach both subject matter and the intellectual arts of critical thinking, creativity, and problem solving. Reformers urged campuses to extend general education into the upper years and to redesign the major to serve similar crosscutting intellectual goals. Indeed, as more and more students enrolled in preprofessional degree programs rather than the traditional arts and sciences, educators began to see liberal education itself less as a matter of what subjects are studied than of how they are taught.

As pedagogy moved to the foreground, it was perhaps inevitable that long-established teaching practices would be questioned from outside colleges and universities as well as from within. Large lecture classes with little opportunity for students to interact with the professor became a popular emblem for whatever people deemed wrong with higher education. The nation's research universities were criticized for not paying sufficient attention to the education of undergraduates, delegating much introductory teaching to poorly supported graduate students or short-term instructors, and focusing recognition and reward on faculty research at the expense of teaching. Finally, concerned with rapidly rising tuition, critics also began questioning the meaning of the baccalaureate degree, asking institutions to take responsibility for what undergraduate students actually learned during their college years. How well, people wanted to know, were colleges preparing students for the new global economy and for life in the uncharted waters of the post–cold war years? Could they do better?[10]

The College Classroom on Shifting Ground

If it were possible to swoop down over the nation's colleges and universities and peer into the work of teaching and learning today, it would be clear, very quickly, how dramatically in the last two to three decades the college classroom has changed. These changes are spurring the growth of the commons because they provoke educators to ask questions about teaching and learning that cannot be answered easily through conventional wisdom and resources alone.

Many changes are well known. For starters, the traditional student entering college full-time right after high school, supported by parents or working only part-time, is now "the exception rather than the rule. In 1999–2000, just 27 percent of undergraduates met all of these criteria" (Choy, 2002, p. 1). More than 40 percent of undergraduates in 1999–2000 were older than twenty-four years, more than a quarter were thirty or older, and nearly half of undergraduates attended college part-time. Today, many students have families and jobs that necessarily take precedence over schoolwork, so that after class they rush back to work or go home to family responsibilities. Classrooms are increasingly populated with men and women who are the first in their families to attend college, and who are sometimes unfamiliar with the routines and expectations of academic life. Indeed, in 1999–2000, 37 percent of undergraduates were first-generation college goers. Individuals identified as ethnic or racial minority accounted for 32 percent of all undergraduates in higher education in 1999–2000, up from 26 percent in 1995, and 17 percent in 1976 (Horn, Peter, Rooney, and Malizio, 2002).

The subjects that students study have also changed. Preprofessional programs continue to grow, and are being recast with links to the liberal arts. Disciplines are changing. The canon of works studied in college has become multicultural, including books by women, authors from ethnic and racial minority groups, and writers and scholars from around the world. Stanford University English professor Andrea Lunsford invites us, for instance, to "look around [English where] . . . you will find a very broad definition of 'literature' and of reading, a definition that clearly includes film, video, multimedia and hypertext, and discourses not traditionally thought of as 'literature' (such as Deaf and Spoken Word poetry, cookbooks, tombstone inscriptions) right alongside studies of canonical writers and their print texts" (Lunsford, 2006).

Indeed, the contours of most disciplines have shifted significantly. For example, Hyman Bass, past president of the American Mathematical Society, notes that mathematics has become "much more out in the world

than it was even a quarter century ago. There are more directions of exploration within mathematics, with a greater diversity of tools and methods; there are substantial interdisciplinary interventions of mathematics in a variety of fields; the utility of mathematics for many problems of science and society is increasingly evident; and mathematics has a growing presence in administrative and policy environments, both in universities and at the national level" (Bass, 2006).

And for many students and faculty much of the most exciting work today occurs in the shifting boundaries between fields, be it in biochemistry, American studies, or more ad hoc conjunctions. In short, there is far less agreement now about what is most important to teach and to learn.

Along with changes in students and content come changes in pedagogy. One of the myths that dogs discussions of higher education is that classroom approaches are frozen in time. As we have argued, however, that view fails to account for shifts that have occurred historically and that are accelerating today. According to the Higher Education Research Institute Faculty Survey, the proportion of faculty who report "extensive lecturing" has gone from 55.7 in 1989–90, to 48.5 in 1995–96, to 46.9 in 2001–02 (Astin, Korn, and Dey, 1991; Sax, Astin, Arredondo, and Korn, 1996; Lindholm, Astin, Sax, and Korn, 2002). The wonderful title of Donald Finkel's *Teaching with Your Mouth Shut* (2000) is telling in this regard, representing a view of teaching based more on engaging students, listening to them, and involving them in their own learning. The literature today documents a growing commitment to new (or newly discovered) pedagogies, including problem-based learning, community-based learning, service learning, and undergraduate research. And of course, technology continues to generate new discussions, experiments, and tools for teaching and learning.

Different pedagogies entail different kinds of assignments and assessments aimed at different purposes and outcomes. Even a cursory scan of goals listed in contemporary course syllabi reveals a focus on cross-cutting abilities and dispositions that was not so common in the past. Tasks required of students have changed accordingly. In addition to the traditional, all-but-ubiquitous research paper, or instead of it, students today may be asked to write for real audiences in the community; individual intellectual work, the long-standing coin of the academic realm, is now complemented by a strong dose of group work and collaborative projects. Students may find that part of their grade depends on collaboration with others in developing a presentation for their fellow students, or a multimedia Web site that can be seen by others around the

world. They may find guidelines in the syllabus for assignments that take them outside the classroom to work in a service learning setting in the community.[11]

It is hardly necessary to mention recent transformations in the material culture of teaching. Participation in distance education is rising among undergraduates, as well as among graduate and professional-degree students. In many fields, faculty and students are using electronic archives, technical computing software, computer-aided design, simulation systems, and the like. The use of e-mail and the Web is everywhere in academe. And beyond the pioneers and early adopters, mainstream faculty are rethinking classroom practice with these new tools in mind. How does one manage and make good use of e-mail communication with students? How does one manage and make good use of course-specific Web sites, with the opportunities afforded for collaborative learning by widely adopted "learning systems" such as Blackboard and WebCT? What do the new technologies mean for assignments and assessment? How are new media changing the nature of expert practice in one's field? Do these changes in how mathematicians, scientists, social scientists, humanists, or management professionals conduct their work alter what and how students should learn about these fields and what and how their teachers should teach? (Huber, 2004; see also Ayers, 2004; Batson and Bass, 1996; Brown, 2000; Laurillard, 2002.)

All of these changes—in students, content, methods, assessment, and technology—invite pedagogical inquiry. Sometimes educators' questions lead them to an electronic discussion list, down the hall to the office of a colleague, to technical support staff, or to a campus center for teaching and learning. Increasingly, the path also leads to a workshop or conference session, and to books, articles, or online resources in their own or a neighboring field. For those who keep asking pedagogical questions, like Dennis Jacobs, the chemist at Notre Dame, this process of inquiry can lead even further, to making their own contributions to the growing body of knowledge about teaching and learning. This is what the teaching commons is all about. Through the combined efforts of educators across the country—and around the world—college teaching is beginning to look more like other professional fields, with a literature and communities that study and advance critical aspects of practice.

Our argument, then, is that the scholarship of teaching and learning is an imperative for higher education today, not a choice. Embracing it means taking ownership of the challenges posed by shifting circumstances, which, though challenging, are also, properly defined, intellectually engaging,

generative, and potentially consequential. Scholars of teaching and learning understand classroom difficulties as problems and puzzles to be systematically explored and addressed in ways that contribute to a growing teaching commons. To move teaching from "private to community property," to build a robust commons on a large scale, will require all the intelligence, commitment, and imagination that the academic community can bring to bear. But the movement to do so is, we believe, one of the most hopeful signs that the academy will be able to fulfill its changing teaching mission in the years to come.

NOTES

1. This epigraph is from Lee S. Shulman's "Teaching as Community Property: Putting an End to Pedagogical Solitude" (1993), one of the foundational essays for the scholarship of teaching and learning. The reason teaching is not more valued in the academy, Shulman argues, is not because campuses do not care about it but "because the way we treat teaching removes it from the community of scholars" (p. 6). Thus, he calls for teaching's reconnection to the disciplinary and professional communities in which faculty pursue their scholarly work—a change that would require faculty to document their pedagogical work and make it available to their peers.
2. This epigraph is from the Creative Commons Web site (http://creativecommons.org). As reporter Andrea Foster explains in the *Chronicle of Higher Education* (2004), "Creative Commons is a group that developed an alternative copyright system to make literature, music, films, and scholarship freely available to the public. Now it plans to do the same for scientific and technological research . . . through an alternative licensing scheme."
3. Jacobs's approach to introductory chemistry has been adopted in physics and engineering at Notre Dame, and he is now exploring ways to include service learning in undergraduate chemistry. For information about his scholarship of teaching and learning, see his Web site: http://www.nd.edu/~djacobs/educ.html. His alternate approach to teaching general chemistry is further documented in an electronic portfolio: see Jacobs, 2001.
4. We draw in this section on Huber, Hutchings, and Shulman (2005).
5. Although there is now wide agreement that institutions of higher education should be accountable to the public for student outcomes, there is little agreement about which outcomes colleges and universities should—or could—account for. See, for example, the opinions of eight higher education leaders in "How Can Colleges Prove They're Doing Their Jobs?" in

the *Chronicle of Higher Education* (2004). As the introduction to that article notes, lack of agreement on this issue may have contributed to the failure of Congress to reauthorize the Higher Education Act in 2004. The National Center for Public Policy in Higher Education (2004) has given all states an incomplete on "learning" in its biennial report *Measuring Up,* which grades the states on their performance in higher education (see http://measuringup.highereducation.org/qa.cfm). Information about the accreditation agencies' efforts to encourage institutions and programs to monitor learning outcomes is available through their Web sites, and the National Survey of Student Engagement is described at http://www.indiana.edu/~nsse/. See Cambridge 2001 for information about the National Coalition for Electronic Portfolio Research.

6. Historian Julie Reuben writes that it was uncommon for colleges to have lab equipment before the Civil War, but by the 1880s scientists were pointing to the desirability of teaching science not through recitation, where students learned the results of science, but through laboratories, where students could learn how to think scientifically for themselves (1996). "In the new social sciences," Reuben adds, "instructors used the seminar as the counterpart to laboratory studies in the natural sciences" (p. 66). Of course, new approaches did not entirely replace old ones. For example, at Stanford University during the 1890s and early 1900s: "Lectures, recitations, weekly quizzes, and major exams were familiar fare for students . . . and the introduction of laboratories in the sciences and seminars in history and other disciplines broadened the teaching repertoires that professors used in their courses" (Cuban, 1999, p.18).
7. This is a distinction that we take from Fenstermacher (2003), who in turn cites Bruce Kimball's discussion of two complementary but sometimes conflicting emphases in liberal education (1986).
8. Indeed, there is interest in general education (however conceived) as a way of strengthening democracy and civic well-being in Europe and Asia as well as at home (Association of American Colleges and Universities, 2002; Kimball, 2003; Orrill, 1997; Rothblatt, 2003).
9. According to the United States Bureau of the Census (1975) the number of students grew from 2.3 million in 1950 (or 14.2 percent of the eighteen- to twenty-four-year-old population) to 7.9 million in 1970 (or 32.1 percent of the eighteen- to twenty-four-year-old population). The number of institutions and faculty also dramatically increased. In 1950, there were about 1,823 colleges and universities with 190,000 faculty members; in 1970, the numbers were 2,525 institutions with 532,000 faculty (Metzger, 1987, cited in Rosovsky and Hartley, 2002).

10. One of the most influential reports of this kind was *Reinventing Undergraduate Education: A Blueprint for America's Research Universities,* published in 1998 by the Boyer Commission on Educating Undergraduates in the Research University. A series of events and publications organized by the Reinvention Center at Stony Brook have helped sustain interest and encourage innovation in undergraduate education, especially at doctoral and research universities (http://www.sunysb.edu/Reinventioncenter).
11. The new senior assignments at Southern Illinois University-Edwardsville (SIUE) provide an interesting example. Each department designs an assignment that seniors must pass to graduate—it cannot be an examination but instead must be a task for which students demonstrate "in practice an application of what they have learned over their entire undergraduate career" (Association of American Colleges and Universities, 2004, p. 2). The actual kinds of senior assignments required in each department vary—in 2002, for example, anthropology's was a written paper with an oral "conference" presentation, biology's was lab, field, or library research presented in a scientific talk or scientific poster format with oral defense, and theater and dance required a written presentation with an oral defense of a project, or choreography (see SIUE's Web site: http://www.siue.edu/~deder/assess/taba02.html).